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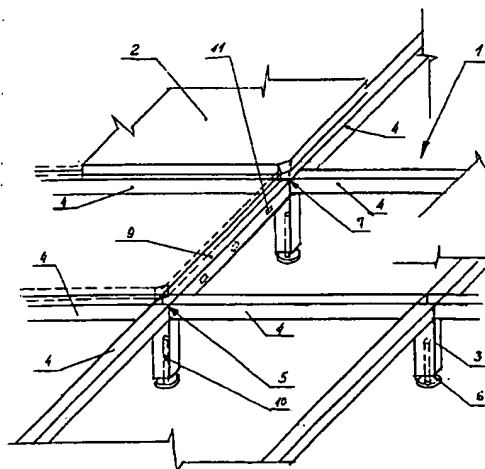
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(54) Title: **RAISED FLOORING SYSTEM**



(57) Abstract: The raised flooring system finds implementation in the building of plants and different premises incorporating machinery and equipment that are raised with regard to the floor level, as well as in display rooms or automotive displays. The raised flooring system comprises support means (1) on which modules (2) comprised by panels are fastened. The support means (1) comprises more than one U-shaped elements, each of the said elements being formed by two vertical supports (3) and a cross-beam (4) is fastened by means of clamp means (5) between the said supports. Each of the said vertical supports (3) ends with an adjustable supporting footing (6). On the upper end of each of the walls of the said vertical supports is mounted a receiving means (7) corresponding to each of the opposite clamp means (5) of each bearing beam (4). Each of the said modules (2) comprises one panel.



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RAISED FLOORING SYSTEM

Technical field

The invention is intended for industrial purposes in building of plants and different premises, housing machinery and equipment that are somewhat raised with relation to the floor as well as in show-rooms or automotive displays in which the exhibits or the automobiles are placed on a raised flooring corresponding in its design, geometric dimensions and space orientation to the respective exhibit.

Prior Art

A raised flooring system is known comprising a flooring and vertical metallic supports whose height determines the distance of raising the flooring above the permanent floor of the room. Each flooring is formed of a pair of panels connected to each other by means of eccentric joints located along the periphery of each separate panel and in each of their four angles an additional aperture is provided. Each flooring formed in such a manner is supported in its central portion by a vertical metallic support. In the upper portion of each vertical metallic support are provided four pins (studs) symmetrically located in relation to each other and corresponding to and joining each panel in its additional apertures. In the bottom portion the metallic support ends with a supporting footing. Each panel is shaped with a plywood board enclosed by a metallic frame.

A drawback of the known raised flooring system is the fact that it is labor consuming and the height of raising is not adjustable. This means that separate corresponding metallic supports have to be made for each technologic raising height. The manufacture of the separate components of the system requires precision and accuracy in their matching, with no guarantee for sufficient stability, lack of vibrations and great load capacity.

Technical Essence of the Invention

The problem requiring solution is to create a raised flooring system having technologic structure that is made lighter and wherein stability, lack of vibrations, greater load capacity as well as universality of the flooring can be achieved with relation to the height, shape and geometric dimensions.

The problem is solved by means of a raised flooring system comprising a supporting means in the form of vertical supports on which modules comprised of panels are fastened.

The supporting means according to the invention is made of more than one U-shaped element formed by two vertical supports having square cross-section and between these supports by means of clamps a cross beam is fixed, each vertical support ending with adjustable supporting footings. In the upper end of each of its walls a receiving element is mounted that corresponds to each of the opposite clamps of each support beam. At that each module comprises one panel.

The clamps itself is in the form of a hook, fit, bolt or pin.

Furthermore the receiving means is in the form of a locking means that corresponds and is located opposite to the clamp means.

Furthermore the adjustable supporting footings are provided with an adjustable means in the form of an adjustable bolt (pin).

In a preferred embodiment of the invention the adjustable means is in the form of an adjustable telescopic means.

The advantages of the invention are the achieved stability and lack of vibrations due to the form of the module of the raised flooring and the supporting U-shaped means as well as the greater load carrying capacity. Furthermore due to the adjustable supporting footings the system has universality with regard to the variations of the height. The components of the system have simpler and lighter structure, standard embodiment that in combination with the above mentioned advantages motivates a constant distribution demand. Further advantage is the possibility of producing raised floorings that are different in shape, dimensions and size determined by the technological requirements or by the required special design and load capacity.

Description of the accompanying drawings

The invention is further clarified by means of the accompanying drawings where:

Figure 1 is a general perspective view of the raised flooring system according to the invention,

Figure 2 is a general perspective view of the support U-shaped means of Fig. 1 according to the invention,

Figure 3 is a general perspective view of the horizontal beam of the support U-shaped means of Fig. 2 according to the invention,

Figure 4 is a general perspective view of the module of Fig. 1 according to the invention.

According to the invention and as shown on Figures 1, 2, 3 and 4, the raised flooring system comprises a support means 1, whereon the flooring is located, the said flooring comprising a plurality of modules 2. The support means 1 representing metallic or produced of another material bearing structure, comprises a number of U-shaped means, each of the said means being formed by two vertical supports 3 with a cross-beam 4 provided between the said supports. Clamp means 5 is mounted on each end of the cross-beam 4. Each vertical support 3 has on its bottom end an adjustable supporting footing 6. On the upper edge of each of its walls a receiving means 7 is mounted, the latter corresponding to each of the opposite clamp means 5 of the cross-beam 4. Each module 2 comprises at least one flat plywood panel 8 provided with catch means 9 arresting them against displacement. The catch means 9 can be mounted on the cross-beam 4 as well. Furthermore bilateral fitting apertures 11 are provided on the cross-beam 4, the form of the said apertures being determined by the form of the additional reinforcing means that could be fitted in if necessary.

The clamp means 5 belonging to each of the edges of the cross-beam 4 is in the form of a hook, fit, bolt or pin and the receiving means 7

belonging to the upper edges of each of the walls of each vertical support 3 is in the form of a locking means corresponding to and located opposite to the clamp means 5.

Each adjustable supporting footing 6 of the vertical supports 5 is provided with an adjustable means, e.g. in the form of an adjustable telescopic means. The adjustable bolt or pin 10, the adjustable telescopic means or other means having the same or similar function can be brought to the upper end of the vertical support 3 so that the adjustment of their height could be carried out quickly and easily. The adjustable supporting footings 6 are able to provide different height and alignment along a predefined horizontal plane of the vertical supports 3 as well as of the whole raised flooring.

Use of the invention

The raised flooring system finds implementation in foundations of machines and equipment in building of new plants or in the renovation of old ones. The system provides the possibility of especially wide use in display halls or in automotive displays as well as in any other space arrangement of exhibits or equipment that needs a flooring raised in the air on a certain height and aligned along a predetermined horizontal plane. Each of the components of the support means 1 produced in the form of a metallic structure or bearing structure made of another load carrying material, is made of metallic profiles or pipes. In this manner a lighter technological structure is provided with sufficient stability and greater load carrying capacity.

The invented basic structural U-shaped component for building the bearing structure according to the invention provides for different combinations with regard to their location in the space. The height adjustability as well as the leveling of the whole raised flooring by means of the adjustable vertical supports 3 of the U-shaped means provide independence and universality of the system with regard to any external conditions.

The modules 2 made of a thin plywood panel provide for the easy assembling and disassembling and for the universality with regard to the geometrical dimensions and the color scheme.

The combination of the different possibilities regarding the height, leveling and load carrying capacity provided by the metallic structure, as well as different geometric dimensions and design depending on the modules, provide for the universality of the system for raised flooring.

The vertical supports 3 and the cross-beam 4 that comprise the U-shaped element, may be made of a closed U-profile, set square, V-shaped steel or another type of fittings, steel rods or fixtures, as well as of piping. Also the cross-beam 4 may be mounted as an additional supporting rib in a structure comprised by U-shaped elements that are fixed to each other subsequently in two parallel beams. In order to increase the load carrying capability, at predetermined spots between the said two parallel beams is mounted a cross-beam 4 functioning as an additional supporting rib.

The U-shaped elements may be made beforehand and when brought to the flooring location, be fixed to each other in different configurations by means of intermediate cross-beams 4.

The clamp means 5 and the corresponding receiving means 7 may be made in the form of hooks turned against each other and having a width corresponding to the width of the wall of the vertical support 3 and of the cross-beam 4. Due to the reversed inclination of the hooks, the said hooks lock into each other after their mounting.

The catch means 9 protect the modules 2 against sliding with regard to each other. The catch means 9 may be in the form of a little fringe, small cube or a similar small element mounted on the upper plane of the cross-beam 4 of the U-shaped element or on the bottom plane of each of the modules 2.

Furthermore on the cross-beam 4 are provided two-sided mounting apertures 11 that allow additional reinforcing elements to be mounted.

These additional reinforcing elements are located diagonally or opposite and parallel to each other at such places that need additional reinforcing of the structure, in case of a special use of the system, requiring special technological requirements to be carried out in the process of its constructing.

CLAIMS

1. Raised flooring system including a support means in the form of vertical supports with modules fixed thereon, the said modules comprising panels, **characterized in that** the support means (1) comprises more than one U-shaped element, formed by two vertical supports (3), a cross-beam (4) being fastened by means of clamp means (5) between the said supports, at that each vertical support (3) ending with adjustable supporting footings (6) and a receiving means (7) being fastened to the upper end of each of the walls of the said vertical support (3), the said receiving means (7) corresponding to each of the clamp means (5) of each bearing beam (4) and at that each module (2) comprises at least one panel (8).
2. System according to claim 1, **characterized in that** the clamp means (5) is in the form of a hook, fit, bolt or pin.
3. System according to claim 1, **characterized in that** the receiving means (7) is in the form of locking means that is corresponding and opposite to each clamp means (5).
4. System according to claim 1, **characterized in that** the adjustable supporting footings (6) are provided with an adjusting means in the form of an adjusting bolt or pin (9).
5. System according to claim 4, **characterized in that** the adjusting means is in the form of an adjusting telescopic means.

Literature:

1. System "OKTANORM", Germany.

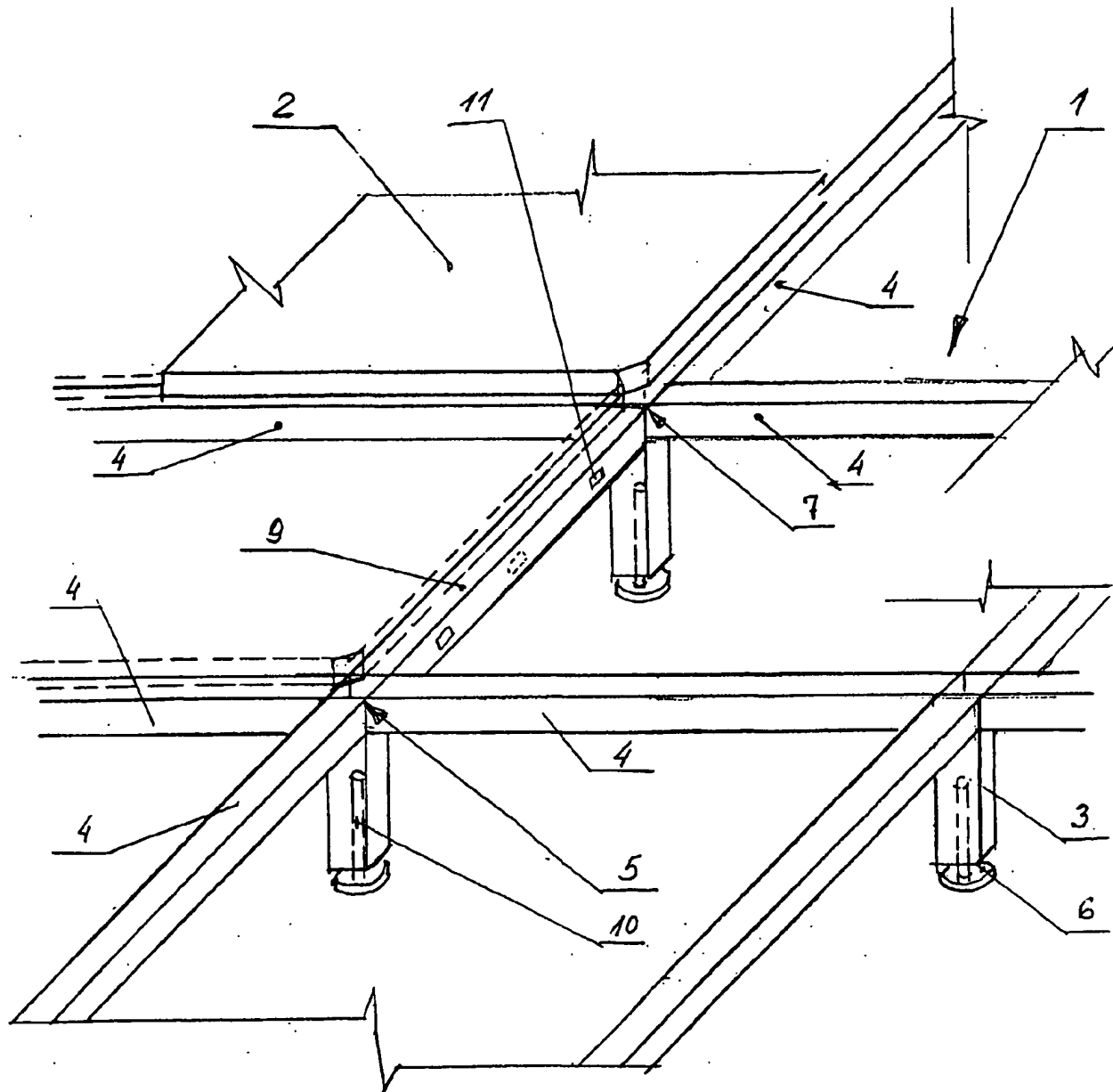
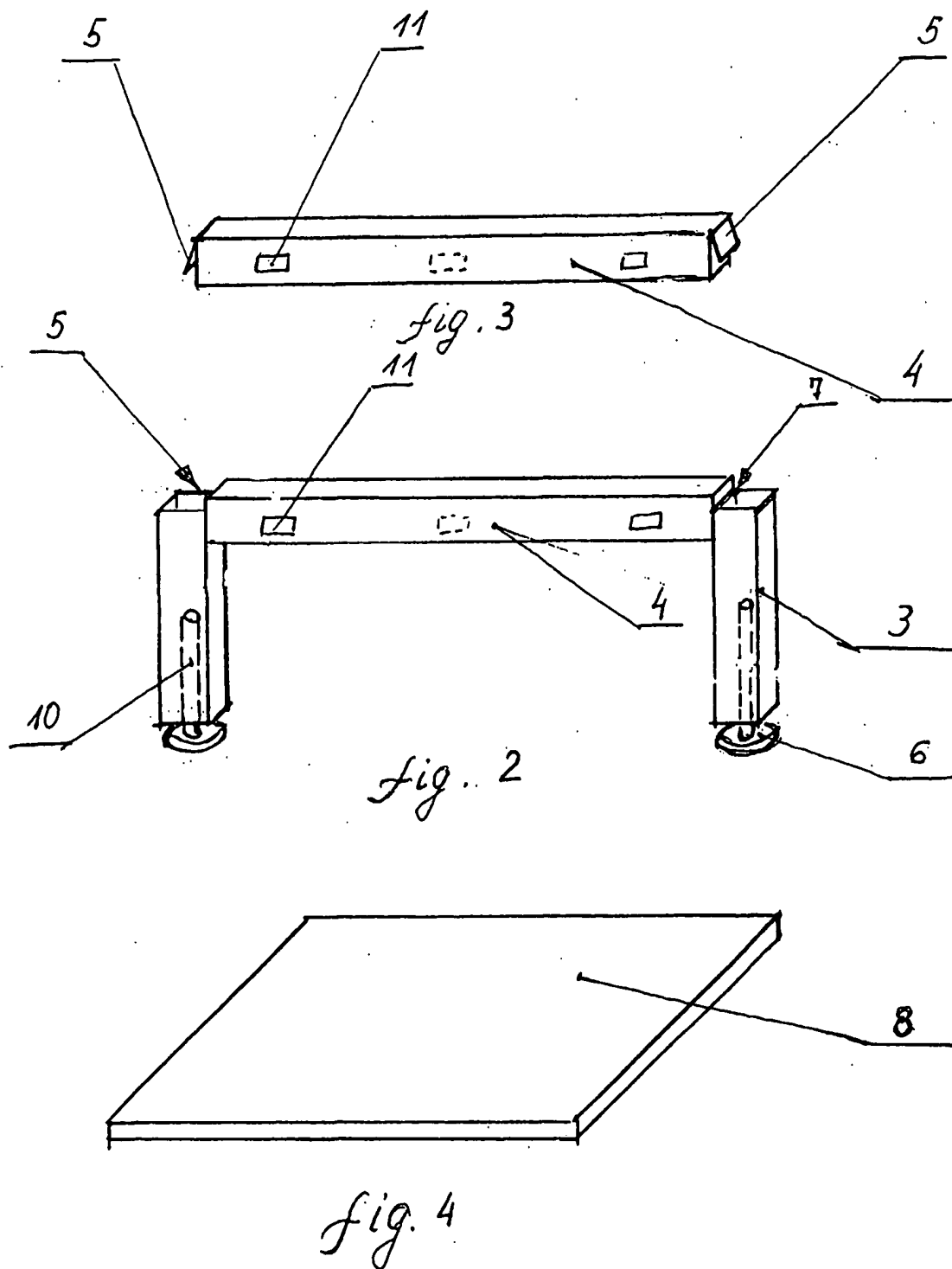


fig.1



INTERNATIONAL SEARCH REPORT

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
IPC 7 E04F E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 893 441 A (CATALANO COSIMO ET AL) 16 January 1990 (1990-01-16) column 1, line 54 - column 2, line 43; figures 1-4	1-5
X	GB 2 140 058 A (CHENEL GUY G) 21 November 1984 (1984-11-21) page 2, line 82 - line 118; figure 4	1-5
X	EP 0 563 505 A (PLOTINI ALLESTIMENTI SRL) 6 October 1993 (1993-10-06) column 3, line 12 - column 4, line 17; figures 1,7,13	1-5
X	FR 2 417 998 A (LAMBERBOURG EVELYNE) 21 September 1979 (1979-09-21) page 4, line 15 - line 21; figures 1,9	1-5
	-/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 155 759 A (COLLIER WILLIAM R) 25 September 1985 (1985-09-25) figure 2 —————	1-5

INTERNATIONAL SEARCH REPORT

Information on patent family members

(Int.) Int. Application No.

PCT/BG 02/00014

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4893441	A	16-01-1990	IT 1210168 B AT 65106 T DE 3680155 D1 EP 0204281 A2	06-09-1989 15-07-1991 14-08-1991 10-12-1986
GB 2140058	A	21-11-1984	FR 2546216 A1 DE 3418146 A1	23-11-1984 22-11-1984
EP 0563505	A	06-10-1993	IT 226426 Z2 EP 0563505 A1	16-06-1997 06-10-1993
FR 2417998	A	21-09-1979	FR 2417998 A1	21-09-1979
EP 0155759	A	25-09-1985	US 4630417 A AT 63962 T CA 1239766 A1 DE 3582943 D1 EP 0155759 A2 US RE33220 E	23-12-1986 15-06-1991 02-08-1988 04-07-1991 25-09-1985 22-05-1990